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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/636,237 | 08/10/2000 | Antoine Berthet | 28944/36657 | 6959 |

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GARDNER CARTON & DOUGLAS LLP
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191 N. WACKER DRIVE, SUITE 3700
CHICAGO, IL 60606

| EXAMINER |
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CORRIELUS, JEAN B

| ART UNIT | PAPER NUMBER |
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2637

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/636,237

Applicant(s)

BERTHET ET AL.

Examiner

Jean B Corrielus

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-9 is/are allowed.
- 6) ☒ Claim(s) 10 and 12-15 is/are rejected.
- 7) ☒ Claim(s) 11 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitra et al US Patent No. 5,533,063 in view of Franz et al US Patent No. 6,222,835.

Mitra et al discloses a method and apparatus (fig. 15A) comprising means 52 for running an initial linear estimation of the coefficients of the impulse response of the transmission channel on the basis of the specific learning symbols transmitted see fig. 15A; elements 48 and 50 for subjecting equalization and decoding process and providing equalized signal to the decoder 50; running an updated estimation coefficient in element 54 on the basis of the equalized signal and the decoded signal. However, Mitra et al does not explicitly teach the decoded information is passed directly to the equalizer in an iterative manner. It also fails to teach that the signal is re-interleaved prior to being provided to the equalizer and de-interleaved prior to being provided to the decoder. In the same field of endeavor, Franz et al teaches fig 4 a system in which an equalized signal generated by equalizer 10 is deinterleaved by deinterleaver 12 prior to being provided to decoder 14 on the other hand, Franz also teaches that a decoded

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signal decoded by decoder 14 is interleaved by interleaver 20 prior to being provided to equalizer 10 in an iterative manner see col. 4, lines 3-10. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Mitra et al in order to reduce error rate of the data provided by the decoder and improving the signal to noise ratio.

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitra et al US Patent No. 5,533,063 in view of Franz and further in view of Seshadri US patent No. 5,263,033.

As applied to claim 10 above, Mitra et al and Franz disclose the invention substantially as claimed but does not teach specifically that the equalization process is a Viterbi SISO MLSE equalization process with weighted inputs coupled with a re-estimation by an iterative process.

In the same field of endeavor, Seshadri teaches that the equalization process is a Viterbi SISO MLSE equalization process with weighted inputs coupled with a re-estimation by an iterative process see fig. 5 and col. 4, line 10-col. 6, line 22. It would have been obvious to one skilled in the art at the time of the invention to incorporate such a teaching in Mitra et al and Franz so as to produce a pattern which is most likely to be close to the received pattern see col. 4, lines 20-22. In addition, it would have been obvious to one skill in the art to implement the decoding element as BCJR decoding in order to improve signal detection.

4. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitra et al US Patent No. 5,533,063 in view of Franz and further in view of applicant's background of the invention page 2.

As applied to claim 10 above, Mitra et al and Franz disclose the invention substantially as claimed but does not teach specifically the use of DDFSE process weighted outputs coupled with a re-estimation of the bootstrap type. It would have been obvious to one skill in the art at the time of the invention to incorporate such a teaching in Miltra et al and Franz in order to place the estimated transmission channel in minimum phase. In addition, it would have been obvious to one skill in the art to implement the decoding element as BCJR decoding in order to improve signal detection.

As per claim 15, applicant background of the invention teaches a GSOVA coupled with a re-estimation of the bootstrap type. See page 3. Given that, it would have been obvious to one skill in the art at the time of the invention to incorporate such a teaching in Mitra et al and Franz in order to improve signal detection.

Allowable Subject Matter

5. Claims 11 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 1-9 are allowed over the prior art of record.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. **Any response to this final action should be mailed to:**

Box AF

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 305-872-9314, (for formal communications; please mark "EXPEDITED PROCEDURE") and (for informal or draft communications, please label "PROPOSED" or "DRAFT")

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Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is (703) 305-4023. The examiner can normally be reached on Monday-Thursday from 7:00 A.M. to 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour, can be reached on (703) 306-3034.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3800.


Jean B. Corrielus

Primary Examiner

TC-2600